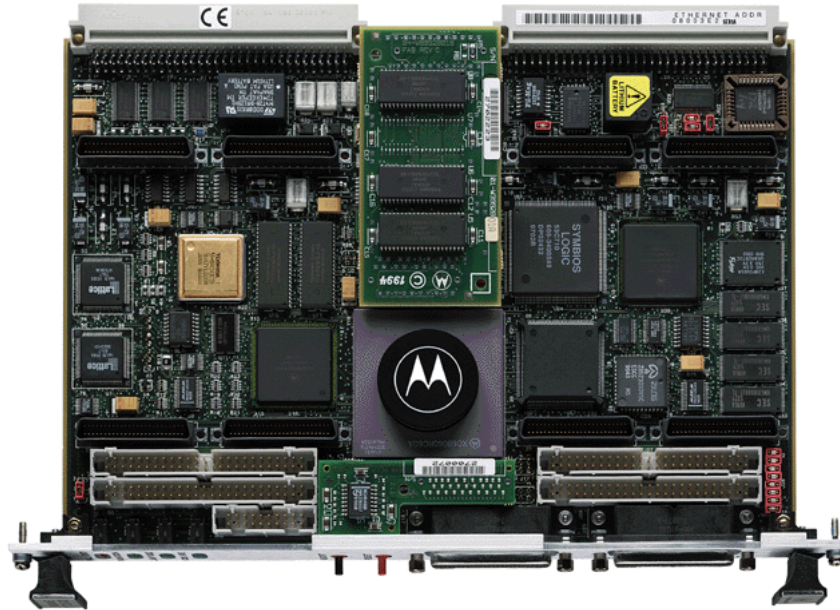# MVME172
VME EMBEDDED CONTROLLER

Advantages

The MVME172 allows VME Embedded Controller users to achieve the price performance of RISC architectures while maintaining MC68000 object code compatibility.

By combining the MC68060 superscalar performance with a wide range of optional features and the IndustryPack® interface, OEMs can select the exact product for their application, rather than paying for unwanted features.

The MVME172 allows users of the MVME162 to increase computational performance in addition to DRAM and Flash memory size while maintaining software and hardware compatibility.

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Features

- 60 MHz MC68060

- Optional 64 MHz MC68LC060

- Optional VMEChip2 A32/D64 VMEbus master/slave interface with system controller function

- 4, 8 or 16MB of shared DRAM

- 512KB of SRAM with battery backup

- 2MB Flash memory

- 8K x 8 NVRAM and time-of-day clock with battery backup

- Two serial communication ports; console is EIA-232-D DTE; Port 2 is user configured via Serial Interface Module (SIM)

- Four 16- or 32-bit IndustryPack ports with one DMA channel per port

- Six 32-bit timers (four without VMEbus) and watchdog timer

- Optional SCSI bus interface with 32-bit local bus burst DMA

- Optional Ethernet transceiver interface with 32-bit local bus DMA

- One 32-pin JEDEC socket for EPROM

- Remote RESET/ABORT/STATUS control functions

- On-board debugger and diagnostic firmware

The Motorola Commitment

Motorola Computer Group is committed to providing best-in-class embedded computing solutions. The MVME172 Series reinforces this commitment by providing superior hardware, price performance, and faithfulness to the tenets of open computing: modularity, scalability, portability, and interoperability.

The MVME172 is offered with a five-year limited warranty which reduces the cost of ownership and demonstrates our commitment to quality and reliability of products to our OEM partners.

Motorola Computer Group is ISO9001 registered, and provides world class quality in manufacturing, engineering, sales, and marketing.

Ordering Information

Part Number [1]	Description
MVME172-413a	64 MHz MC68LC060, 4MB DRAM, 2MB Flash, four IndustryPack ports with DMA, two serial ports, SCSI and Ethernet [2]
MVME172-433a	64 MHz MC68LC060, 8MB DRAM, 2MB Flash, four IndustryPack ports with DMA, two serial ports, SCSI and Ethernet [2]
MVME172-453a	64 MHz MC68LC060, 16MB DRAM, 2MB Flash, four IndustryPack ports with DMA, two serial ports, SCSI and Ethernet [2]
MVME172-513a	60 MHz MC68060, 4MB DRAM, 2MB Flash, four IndustryPack ports with DMA, two serial ports, SCSI and Ethernet [2]
MVME172-523a	60 MHz MC68060, 8MB DRAM, 2MB Flash, four IndustryPack ports with DMA, two serial ports, SCSI and Ethernet [2]
MVME172-533a	60 MHz MC68060, 16MB DRAM, 2MB Flash, four IndustryPack ports with DMA, two serial ports, SCSI and Ethernet [2]

Memory Modules

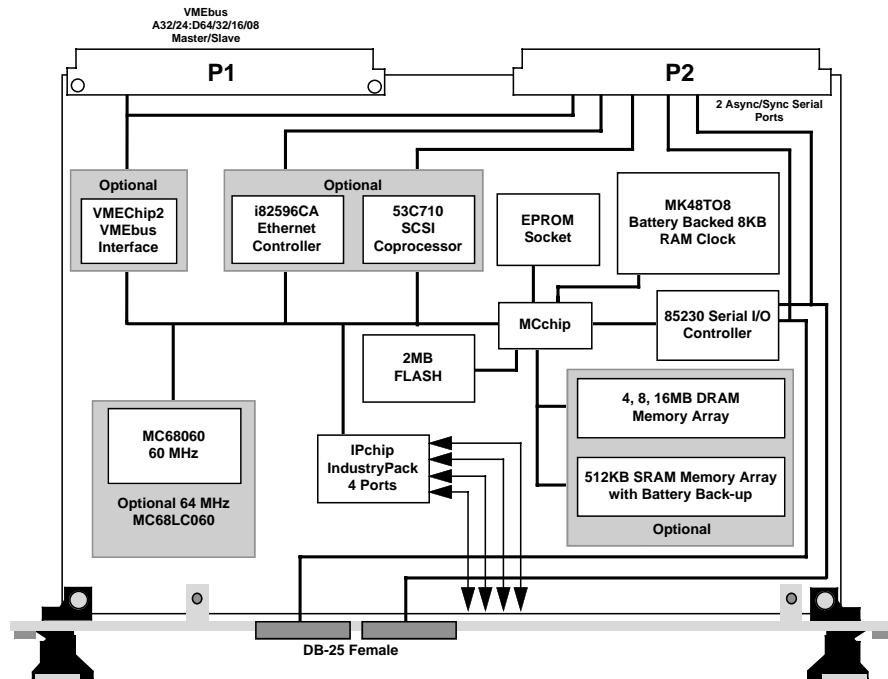|	
MEM162-502a	4MB DRAM module (for upgrading 4MB versions to 8MB)
MEM162-503a	12MB DRAM module (for upgrading 4MB versions to 16MB)

Serial Interface Modules (SIMs)

SIMM05	EIA-232D DTE module
SIMM06	EIA-232D DCE module (factory configuration)
SIMM07	EIA-530 DTE module
SIMM08	EIA-530 DCE module
SIMM09	EIA-485 module

Documentation

VME172FXA/IH	Installation and User's Guide
VME172A/PG	Programmer's Reference Guide
V172DIAA/UM	Hardware Diagnostics Manual
68KBUG1/D	68K Debugging Package User's Manual Part 1
68KBUG2/D	68K Debugging Package User's Manual Part 2
SBCSCSI/D	SCSI Firmware User's Manual

Notes

1. Major revision levels are indicated by alpha character at the end of the part number.

2. Versions of the MVME172 are available without SCSI, Ethernet, VME or IndustryPack interface by special request. Contact local Motorola representative for additional information.

MVME172 Embedded Controller

Labels in diagram:
VMEbus A32/24:D64/32/16/08 Master/Slave
P1 P2
2 Async/Sync Serial Ports
Optional — VMEChip2 VMEbus Interface
Optional — i82596CA Ethernet Controller — 53C710 SCSI Coprocessor
EPROM Socket
MK48TO8 Battery Backed 8KB RAM Clock
MCchip
85230 Serial I/O Controller
2MB FLASH
MC68060 60 MHz — Optional 64 MHz MC68LC060
IPchip IndustryPack 4 Ports
4, 8, 16MB DRAM Memory Array
512KB SRAM Memory Array with Battery Back-up
Optional
DB-25 Female

Microprocessor Options

The MVME172 features the superscalar MC68060 microprocessor which achieves superb integer and floating point performance from its RISC hybrid architecture. The object code compatability of the MC68060 with earlier generations allows a significant performance increase while preserving software investment.

For cost-sensitive applications where floating point performance is not required, the optional MC68LC060 can be substituted.

VMEbus Interface

VMEbus interface functionality is provided by the Motorola designed VMEChip2 ASIC. In addition to controlling the system's VMEbus functions, the VMEChip2 includes a local bus to/from VMEbus DMA controller, VME board support features, as well as Global Control and Status Register (GCSR) for interprocessor communications. The MVME172 also provides support for the VME D64 specification within the VMEbus interface, further enhancing system performance.

IndustryPack Interface

The MVME172 uses the IndustryPack interface to provide additional expansion and connectivity features. The second generation IP2 ASIC features four channels of DMA, and 8 or 32 MHz bus speed, and complies with the ANSI specification. Up to four single-wide or two double-wide IndustryPack modules can be installed, while requiring only one VME backplane slot.

Memory Expansion

The MVME172 is available with three memory options: 4, 8 or 16MB. Expansion memory is designed to be easily upgradable by the user via mezzanine modules.

I/O Connections

Optional MVME712 Series Transition Modules are available to support the use of standard I/O connections for the MVME172 Series. These modules take the I/O connections for the peripherals on board the MVME172 Series from the P2 connection of the module to a transition module that has industry standard connections.

User Specified Options

Because of the flexible nature of the MVME172 design, some options that are not required can be removed from the board. Removable options are: Flash memory, SCSI interface, Ethernet interface, IndustryPack, and VME interfaces. Deletion of these options does not affect hardware or software compatibility.

Software Support

The MVME172 is supported by a wide range of real-time kernels and embedded operating systems.

Emerge Systems, Inc.:	RTUX™
Eyring Research:	PDOS®
Integrated Systems, Inc.:	pSOS+™
Industrial Programming, Inc.:	MTOS™
JMI Software Systems, Inc.:	C EXECUTIVE®
Lynx Real-Time Systems, Inc.:	LynxOS™
Microware Systems Corporation:	OS-9®/OS-9000™
Microtec:	VRTX32™
Wind River Systems, Inc.:	VxWorks®

Specifications

MVME172 Embedded Controller

Processor

Microprocessor:	MC68060
Clock Frequency:	60 MHz
Microprocessor:	MC68LC060
Clock Frequency:	64 MHz
L1 On-chip Cache (I/D):	4/4KB

Memory

Memory Type:	**Dynamic RAM**
Capacity:	4, 8 or 16MB
Read Burst Mode:	5-2-2-2
Write Burst Mode:	4-2-2-2
Shared:	VMEbus and Local Bus
Memory Type:	**Flash ROM**
Capacity:	2MB
Access Cycles:	6-Read, 7-Write
Memory Type:	**User installed ROM**
Capacity/Sockets:	1MB/One 32-Pin PLCC
Memory Type:	**Static RAM**
Capacity:	512KB
Read/Write Burst Mode:	5-3-3-3
Shared:	VMEbus and Local Bus
Battery Type:	Lithium
Battery Life (40° C):	200 days

VMEbus ANSI/VITA 1-1994 VME64 (IEEE STD 1014)

DTB Master:	A16-A32; D08-D64, BLT, UAT + MBLT
DTB Slave:	A16-A32; D08-D64, BLT, UAT + MBLT
Arbiter:	RR/PRI
Interrupt Handler:	IRQ 1-7
Interrupt Generator:	Any 1 of 7
System Controller:	Yes, jumperable
Location Monitor:	Four, LMA32

SCSI Bus

Controller:	NCR 53C710
Local Bus DMA:	Yes, with local bus burst
Asynchronous:	5.0MB/s
Synchronous:	10.0MB/s

Ethernet

Controller:	82596CA
Local bus DMA:	Yes

TOD Clock

TOD Clock Device:	MK48T58; 8KB NVRAM
Replaceable Battery:	Yes

Counters/Timers

Real-Time Timers/Counters:	Six 32-bit programmable, 1 μsec resolution
Watchdog Timer:	Time-out generates reset

Serial Ports

Controller:	One 85230
Number of ports:	Two
Configuration:	EIA-232-D DCE (both ports)
Sync/Async Baud Rate, bps max.:	38.4K
Connector:	Front panel DB-25

Power Requirements (No IP Modules)

	Typical	Maximum
+5 V ± 2.5 %	3.0 Amps	4.5 Amps
+12 V ± 10 %	100 mA	1 Amp
–12 V ± 10 %	100 mA	100 mA

Board Size

Height:	233.4 mm (9.2 in.)
Depth:	160.0 mm (6.3 in.)
Front panel height:	261.8 mm (10.3 in.)
Width:	19.8 mm (0.8 in.)

Hardware Support

Multiprocessing hardware support:	Four mailbox interrupts, RMW, shared RAM
Debug/Monitor (included):	MVME172FW, boot, and diagnostics

Peripheral Connectors

Ethernet:	DB-15 (Located on MVME712 transition module)
SCSI:	68-pin micro D high density
IndustryPack I/O:	Access via four 50-pin connectors

Environmental

	Operating	Nonoperating
Temperature:	0° C to +55° C, forced air cooling exit air	-40° C to +85° C
Altitude:	5,000 m	15,000 m
Humidity (NC):	10% to 80%	10% to 90%
Vibration:	2 Gs RMS, 20-2000 Hz Random	8 Gs RMS, 20-2000 Hz Random

Regulatory Compliance

Intended for use in systems meeting the following EMI/RFI regulations:

US:	FCC Class B
Canada:	DOC Class B
Europe:	VDE Class B, CISPR-B, Œ
Safety:	All printed wiring boards (PWBs) are manufactured with a flammability rating of 94V-0 by UL recognized manufacturers.

Demonstrated MTBF

Mean/90% Confidence:	190,509 hours/107,681 hours

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